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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/019,615 | Applicant(s) CHANDRAN ET AL. | |
| | Examiner James S. Wozniak | Art Unit 2626 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 28-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 and 28-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the office action from 2/5/2007, the applicants have submitted a request for continued examination, filed 8/6/2007, amending independent claims 1, 26, 32, and 57, while adding claim 62 and arguing to traverse the art rejection based on the limitations regarding adjusting partially decoded speech parameters for echo suppression and a network with a hybrid coded/linear format (*Amendment, Pages 23-24*). Applicants' arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments.

2. In response to the previous 35 U.S.C. 101 rejection the applicants argue that claim 57 now features a step for "transmitting the first and second bits in an adjusted state to a far end device to present the first and second bits in audio form to an end user", which overcomes the corresponding 35 U.S.C. 101 rejection (*Amendment, Page 20*). The examiner notes that the transmission of such echo-adjusted bits to a far end device to present the bits in audio form to a user would be a "useful, concrete, and tangible result", and thus, the aforementioned rejection has been withdrawn.

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3. In response to amended claims 1 and 26 and the applicants' corresponding comments (*Amendment, Pages 20-21*), the examiner has withdrawn the previous 35 U.S.C. 112, second paragraph rejection directed to indefinite claim language.

Response to Arguments

4. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

The applicants have amended claims 1 and 57 to revert them to their previous format and argues that these claims would not be single means claims because they do not utilize the "means for" or "step for" language (*amendment, Pages 19-20*). First, it is noted that Claim 57 is not a single step claim because it has been amended to include multiple steps of "adjusting" and "transmitting". In addressing the applicants' arguments regarding claim 1, the examiner points out that although the aforementioned claims do not expressly utilize "means for" language, they are nonetheless means-plus-function claims because the "processor" of claim 1 is described in terms of the function it performs (*Seal-Flex, Inc. v. Athletic Track and Court Construction, 172 F.3d 836, 850, 50 USPQ2d 1225, 1234 (Fed. Cir.1999) (Radar, J., concurring)* ("claim elements without express step-plus-function language may nevertheless fall within 112 6 if they merely claim the underlying function without recitation of acts for performing that function)) (also see *MPEP 2181*). Claim 1 recites a "processor" (means) to (for) "perform...adjust...replace" (function), thus, claim 1 is in means-plus-function format and accordingly is a single means claim. New claim 62 recites an apparatus similar to claim 1 and includes a processor functioning

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with near and far end partial decoders. It is pointed out that such a new claim would not constitute a single means claim because it comprises a plurality of elements.

Now addressing the art rejections, the applicants first comment that claim 1 has been reverted to its previous form by eliminating the “subframe” element, which necessitated the inclusion of Chen (*U.S. Patent: 5,651,091*) in the previous rejection (*Amendment, Page 21*). In addition, the applicants note that the rejection also reverts back to the 35 U.S.C. 102 (e) rejection from 6/8/2006 and present their arguments accordingly (*Amendment, Page 21*).

The applicants argue that Rabipour et al (*U.S. Patent: 6,011,846*) fails to teach the invention recited in claim 1 because Rabipour fails to teach partially decoding an audio signal and performing echo suppression by “varying degrees” (*Amendment, Pages 22-23*).

In response to the argument that Rabipour fails to teach partially decoding an audio signal and teaches away from such a feature because his invention does not synthesize a speech signal, the examiner notes that Rabipour does teach partial decoding. Specifically, Rabipour discloses that an encoded speech frame is received and LPC coefficients and excitation parameters are extracted from that encoded frame (*Col. 3, Lines 48-54*). Thus, Rabipour is taking an encoded frame and removing required information from it or performing partial decoding. This extraction or decoding in Rabipour is only partial because Rabipour does not generate or synthesize a speech waveform, and thus, does not degrade a speech signal because performing echo cancellation in the waveform domain requires re-coding (*Col. 3, Lines 1-10*). So when Rabipour is referring to not synthesizing a speech signal, he means not fully decoding an encoding signal to produce a speech waveform. Similarly, the applicant also teaches not synthesizing a speech signal for echo cancellation (*“only determines the coded parameters from the compression code*

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without actually synthesizing the audio signal from the compression code," Specification, Page 17, Lines 10-15). Thus, since Rabipour discloses extracting speech parameters without performing synthesis, Rabipour does not teach away from the applicants' invention (*i.e., there is no negative teaching regarding partial decoding*), and the applicants also teach not performing full speech synthesis, Rabipour does teach the partial decoding claimed by the applicants.

In response to the argument that Rabipour fails to teach performing echo suppression by "varying degrees," it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Instead, the claimed invention requires only that a first parameter in a partially decoded signal is adjusted to reduce echo, which is taught by Rabipour (*adjusting near end speech parameters in response to a detected echo, Col. 5, Line 35- Col. 6, Line 16*). It is further noted that the terminology echo suppression by "varying degrees" does not appear to be utilized in the specification to describe echo suppression and that inclusion of this term in the claims may raise an issue of new matter. It appears that, by this term, the applicants are referring to using an echo likelihood variable to adjust speech parameters (*Amendment, Page 22*). Although claim 3 seems to recite this feature in a broad sense, which can be read upon by the teachings of Rabipour (*echo compensation adaptive to an echo presence certainty, Col. 5, Line 35- Col. 6, Line 16*), the calculation of this variable and how specifically this variable is used to adjust a speech parameter is not present in the presently claimed invention. If incorporated into claim 1, and clearly recited, the specific echo likelihood calculation and how

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specifically that calculated likelihood is used to adjust a speech parameter by degrees may overcome the teachings of Rabipour.

The applicants traverse the art rejection of claims 32 and 62 for reasons similar to claim 1 (*Amendment, Page 23*). In regards to such arguments, see the response directed to claim 1.

The applicants traverse the art rejection of dependent claims 2-25 and 33-56 for reasons similar to claim 1 (*Amendment, Pages 23-24*). In regards to such arguments, see the response directed to claim 1.

With respect to Claims 26 and 57, the applicants argue that Rabipour fails to teach a network with a hybrid coded/linear format (*Amendment, Pages 23-24*). In response, the examiner notes that such a coding format is well known in the prior art as is evidenced by the applicant's admitted prior art (*Background of the Invention, Pages 2-3 and Fig. 3*). As such, the applicants' arguments have been fully considered, but are moot with respect to the new grounds of rejection in view of the applicant's admitted prior art.

The applicants traverse the art rejection of dependent claims 28-31 and 58-61 for reasons similar to claims 26 and 57 (*Amendment, Pages 23-24*). In regards to such arguments, see the response directed to claims 26 and 57.

Drawings

5. **Figures 1-8** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (*see Background of the Invention, Pages 1-9*). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office

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action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. **Claims 33-56** are objected to because of the following informalities: the group of claims from 33 to 56 is recited as being directly or indirectly dependent upon claim 31. It is believed that those claims directly dependent upon claim 31, should be amended to recite --claim 32-- because claim 31 refers to an apparatus while claim 32 recites "a method", which is referred to in all of the above claims.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. **Claims 1-25** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter that was not described in the

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specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 recites “a processor responsive to...” but lack means for performing the operations that the processor performs.

A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. In re Hyatt, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

Dependent claims 2-25 do not remedy the lack of enablement issue noted above with respect to claim 1, and therefore, are also rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. **Claims 1-4, 7, 12, 15-16, 18-19, 21-22, 32-35, 38, 43, 47, 50, 52-53, and 62** are rejected under 35 U.S.C. 102(e) as being anticipated by Rabipour et al (*U.S. Patent: 6,011,846*).

With respect to **Claims 1 and 32**, Rabipour discloses:

A processor responsive to the near end digital signal to read at least said first parameter of said plurality of parameters, to perform at least one of said plurality of decoding steps on the near end digital signal and the far end digital signal to generate at least partially decoded near end signals and at least partially decoded far end signals (*extracting speech parameters from near and far end encoded speech signals, Col. 3, Line 48- Col. 4, Line 22*); and

Responsive to said at least partially decoded near end signals and at least partially decoded far end signals to adjust the first parameter to generate an adjusted first parameter and to replace said first parameter with the adjusted first parameter in the near end digital signal (*adjusting near end speech parameters in response to a detected echo, Col. 5, Line 35- Col. 6, Line 16*).

With respect to **Claims 2 and 33**, Rabipour discloses:

The first parameter is a quantized first parameter and wherein said processor generates said adjusted first parameter in part by quantizing said adjusted first parameter before writing said adjusted first parameter into said near end digital signal (*replacing speech parameters with adjusted speech parameters after quantization, Col. 6, Line 40- Col. 7, Line 32*).

With respect to **Claims 3 and 34**, Rabipour discloses:

The processor is responsive to the at least partially decoded near end signals and the at least partially decoded far end signals to generate an echo likelihood signal representing the amount of echo present in the partially decoded near end signals, and wherein the processor is responsive to the echo likelihood signal to adjust the first parameter (*Echo compensation adaptive to an echo presence certainty, Col. 5, Line 35- Col. 6, Line 16*).

With respect to **Claims 4 and 35**, Rabipour recites:

Characteristics comprise spectral shape (*near and far end spectrum, Col. 3, Line 48- Col. 4, Line 22*) and wherein said first parameter comprises a representation of filter coefficients (*LPC coefficients including excitation parameters, Col. 6, Lines 20-31*), and wherein said processor is responsive to said echo likelihood signal to adjust said representation of filter coefficients towards a magnitude frequency response (*modifying LPC coefficients based on a modified impulse response, Col. 6, Line 20- Col. 7, Line 32*).

With respect to **Claims 7 and 38**, Rabipour recites:

The magnitude frequency response corresponds to background noise (*correction factor determined using an impulse response for updated LPC parameters corresponding to background noise, Col. 7, Lines 11-62*).

Claims 12 and 43 contains subject matter similar to Claims 4 and 35, and thus, is rejected for similar reasons.

With respect to **Claim 15**, Rabipour discloses LPC coefficients including excitation parameters (*Col. 6, Lines 20-31*).

With respect to **Claims 16 and 47**, Rabipour discloses partial decoding for extracting speech parameters, which avoids synthesis processing (*Col. 1, Line 52- Col. 3, Line 10*).

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With respect to **Claim 18**, Rabipour discloses:

The at least one decoding step comprises post filtering (*synthesis processing of a coded speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10*).

With respect to **Claims 19 and 50**, Rabipour discloses the use of LPC-based speech compression (*Col. 1, Lines 48-51*).

With respect to **Claims 21 and 52**, Rabipour discloses the use of CELP compression (*Col. 8, Lines 8-11*).

With respect to **Claims 22 and 53**, Rabipour discloses averaging a set of near and far end LPC parameters to determine a degree of echo compensation (*Col. 3, Line 48- Col. 4, Line 22*).

With respect to **Claim 62**, Rabipour discloses:

A near end partial decoder to at least partially decode coded near end digital signals, including at least a first parameter of a plurality of parameters representing respective near end audio signals in the coded near end digital signals to form at least partially decoded near end signals (*decoder that extracts speech parameters from a near-end signal, Col. 3, Lines 48-54*);

A far end partial decoder to at least partially decode coded far end digital signals, including at least a first parameter of a plurality of parameters representing respective far end audio signals in the coded far end digital signals to form at least partially decoded far end signals (*decoder that extracts speech parameters from a far-end signal, Col. 3, Lines 48-54*);

A processor responsive to said near end digital signals to read at least said first parameter of first said plurality of parameters in the coded near end digital signals and at least partially decode said near end digital signal and to read a coded far end digital signal to generate at least partially decoded far end signals and at least partially decoded far end signals (*Col. 3, Line 48-*

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Col. 4, Line 22), and responsive to at least said partially decoded near end signals and at least partially decoded far end signals to adjust said first parameter to generate an adjusted first parameter and to replace at least said first parameter with said adjusted first parameter in said near end digital signal to reduce echo in the near end digital signal (*processor for adjusting near end speech parameters in response to a detected echo, Col. 5, Line 35- Col. 6, Line 16*).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 5-6, 13-14, and 36-37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Strawczynski et al (*U.S. Patent: 6,138,022*).

With respect to **Claims 5, 14, and 36**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour does not teach the use of line spectral frequencies (*LSFs*), however Strawczynski teaches the use of such LSF coefficients (*Col. 3, Lines 24-34*).

Rabipour and Strawczynski are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the LSF coefficients taught by Strawczynski in order to provide speech coefficients that uniquely

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define a human articulatory tract, which are suited to a number of different applications
(*Strawczynski, Col. 3, Lines 24-34*).

With respect to **Claims 6, 13, and 37**, Strawczynski additionally recites the use of log area ratio coefficients (*Col. 3, Lines 24-34*).

13. **Claims 8-9 and 39-40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Gritton et al (*U.S. Patent: 5,857,167*).

With respect to **Claims 8 and 39**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour also discloses LPC coefficients related to an energy level (*Col. 5, Line 45- Col. 6, Line 16*). Rabipour does not specifically suggest the use of a codebook gain, however Gritton teaches the use of such a gain parameter (*Col. 6, Lines 55-65*).

Rabipour and Gritton are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the gain codebook parameters taught by Gritton in order to provide a means for compensating for an error between original and synthesized speech (*Col. 4, Lines 31-67*).

With respect to **Claims 9 and 40**, Gritton teaches the codebook gain as applied to Claim 8.

14. **Claims 10-11, 20, 23-25, 41, 42, 46, 49, 51, and 54-56** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen (*U.S. Patent: 5,651,091*).

With respect to **Claims 10 and 41**, Rabipour discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claims 1 and 12. Rabipour does not specifically suggest the use of long-term predictor and pitch period parameters, however Chen discloses the use of such parameters (*Col. 4, Lines 3-44*).

Rabipour and Chen are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the long-term predictor and pitch period parameters taught by Chen in order to provide parameters that exploit the pitch periodicity in voiced speech (*Chen, Col. 4, Lines 29-31*) and impose lesser demands upon echo suppressors (*Chen, Col. 1, Lines 38-48*).

With respect to **Claims 11 and 42**, Chen further recites the use of a long-term pitch predictor and an associated pitch gain (*Col. 3, Lines 14-25*).

With respect to **Claims 20 and 51**, Chen discloses the long-term predictor coding as applied to Claim 11.

With respect to **Claims 23 and 54**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing (*Col. 5, Lines 5-8*).

With respect to **Claims 24 and 55**, Rabipour teaches completing echo suppression for a frame before advancing to a next frame as shown in Figs. 2C and 3, while Chen discloses the subframe based processing as applied to Claim 23.

With respect to **Claims 25 and 56**, Rabipour teaches the frame-based echo suppression system and method that adjusts speech parameters for each speech frame according to a detected echo, as applied to Claim 1, while Chen recites subframe-based processing (*Col. 5, Lines 5-8*).

With respect to **Claim 46**, Rabipour further discloses LPC coefficients including excitation parameters (*Col. 6, Lines 20-31*).

With respect to **Claim 49**, Rabipour further discloses:

The at least one decoding step comprises post filtering (*synthesis processing of a coded speech signal that would inherently include filtering, Col. 1, Line 52- Col. 3, Line 10*).

15. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Christensson et al (*U.S. Patent: 6,510,224*).

With respect to **Claim 17**, Rabipour discloses the echo suppression system and method utilizing spectrum coefficients, as applied to Claims 1 and 12. Rabipour does not specifically suggest the use of power parameters, however Christensson teaches the use of such parameters (*Col. 6, Line 40- Col. 7, Line 8*).

Rabipour and Christensson are analogous art because they are from a similar field of endeavor in speech echo compensation. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the use of power parameters in echo suppression as taught by Christensson in order to achieve improved echo suppression performance based on a power parameter and focused on frequency bands where an echo component could easily be mistaken for near end speech (*Christensson, Col. 7, Lines 1-8*).

16. **Claims 26, 28-31, and 57-61** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of the Applicants' Admitted Prior Art (*AAPA*).

With respect to **Claims 26 and 57**, Rabipour discloses:

A processor responsive to the near end digital signal and the far end digital signal to adjust the first and second bits (*LPC compressed speech data bit stream adjusted based on near and far end speech data, Col. 3, Lines 1-10; Col. 3, Line 48- Col. 4, Line 22; Col. 5, Line 35- Col. 7, Line 32*); and

A transmitter to transmit the first and second bits in an adjusted state to a far end device to present the first and second bits in an audible form to a user (*performing echo suppression in a telecommunication network that would inherently require some type of transmitter to send echo adjusted speech to a caller, Col. 3, Lines 1-10 and 33-43; and Fig. 1*).

Although Rabipour discloses adjusting bits directed to LPC compression code, Rabipour does not specifically suggest the combination of a compression code and a linear code to express a speech signal, such a coding scheme, however, is well known in the prior art as is evidenced by the AAPA. The AAPA recites a TFO GSM standard using a combination of coded speech and PCM bits (*Page 2, Line 11- Page 3, Line 11; and Fig. 3*).

Rabipour and the AAPA are analogous art because they are from a similar field of endeavor in speech compression. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour with the TFO GSM standard recited in the AAPA in order to expand Rabipour's echo cancellation for use in well-known cellular networks (*AAPA, Page 2, Lines 17-19*).

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With respect to **Claims 28 and 58**, the AAPA further recites the use of PCM code (*Page 2, Line 7- Page 3, Line 11*).

With respect to **Claims 29 and 59**, the AAPA recites the TFO GSM standard as applied to Claims 26 and 57.

With respect to **Claims 30 and 60**, the AAPA further recites first bits comprising the two LSBs and second bits comprising 6 MSBs (*Page 3, Lines 3-11; and Fig. 3*).

With respect to **Claims 31 and 61**, the AAPA further recites the use of PCM code for the 6 MSBs (*Page 2, Line 7- Page 3, Line 11; and Fig. 3*).

17. **Claims 44-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen, and further in view of Strawczynski et al.

With respect to **Claim 44**, Rabipour in view of Chen discloses the echo suppression system and method utilizing speech coefficients comprising a long-term pitch predictor and an associated pitch gain, as applied to Claim 42. Rabipour in view of Chen does not teach the use of log area ratios (*LARs*), however Strawczynski teaches the use of such LAR coefficients (*Col. 3, Lines 24-34*).

Rabipour, Chen, and Strawczynski are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the LAR coefficients taught by Strawczynski in order to provide speech coefficients that uniquely define a human articulatory tract, which are suited to a number of different applications (*Strawczynski, Col. 3, Lines 24-34*).

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With respect to **Claim 45**, Strawczynski teaches the use of such LSF coefficients (*Col. 3, Lines 24-34*).

18. **Claim 48** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rabipour et al in view of Chen, and further in view of Christensson et al.

With respect to **Claim 48**, Rabipour in view of Chen discloses the echo suppression system and method utilizing LPC coefficients, as applied to Claim 46. Rabipour in view of Chen does not specifically suggest the use of power parameters, however Christensson teaches the use of such parameters (*Col. 6, Line 40- Col. 7, Line 8*).

Rabipour, Chen, and Christensson are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Rabipour in view of Chen with the use of power parameters in echo suppression as taught by Christensson in order to achieve improved echo suppression performance based on a power parameter and focused on frequency bands where an echo component could easily be mistaken for near end speech (*Christensson, Col. 7, Lines 1-8*).

Conclusion


19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'J. S. Wozniak', with a stylized flourish at the end.

James S. Wozniak
10/2/2007